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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/736,602

12/17/2003

Michael A. Kneissl

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03/06/2006

OLIFF & BERRIDGE, PLC.

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EXAMINER

GOLUB, MARCIA A

ART UNIT

PAPER NUMBER

2828

DATE MAILED: 03/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

11A

**Office Action Summary**

Application No.

10/736,602

Applicant(s)

KNEISSL ET AL.

Examiner

Marcia A. Golub

Art Unit

2828

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --****Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 December 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-50 is/are pending in the application.
- 4a) Of the above claim(s) 4-6, 9-17, 21-24, 27 and 30-50 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 7, 8, 18-20, 25, 26 and 28-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>4/8/05, 5/21/04</u> .   | 6) <input type="checkbox"/> Other: _____                                    |

### **DETAILED ACTION**

Applicant's election with traverse of 1<sup>st</sup> embodiment (claims 1-3, 7-8, 18-20, 25, 26, 28-30) in the reply filed on 2/13/2006 is acknowledged. The traversal is on the ground(s) that the subject matter of different species is sufficiently related. This is not found persuasive because applicant did not submit evidence showing the inventions or species to be obvious variants or clearly admitted on the record that this is the case.

The requirement is still deemed proper and is therefore made FINAL.

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

**Claim 20** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear where the grating is located and if there is more than one grating in the structure. As best determined by the examiner for the purposes of the examination the grating is located in a top cladding layer on top of waveguide (active) layer.

#### ***Claim Rejections - 35 USC § 102***

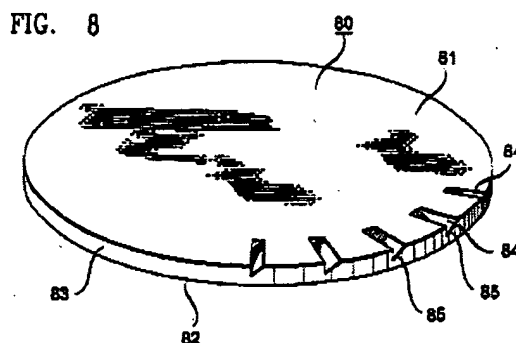
The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 1-3** are rejected under 35 U.S.C. 102(b) as being anticipated by McCall (5,343,490) hereinafter '490.

Regarding **claim 1**, Figs 7 and 8 of '490 disclose "a grating-outcoupled microcavity disk resonator [70,80], defining a plane [81, 82] and having a substantially smooth curved outer periphery [83] (9/55-56), bounded by reflective walls, around and within which light can circulate (3/36-38); the resonator including at least one grating region [84] disposed in the plane [81] of the grating-outcoupled microcavity disk resonator [80]; the grating region [84] serving to outcouple light circulating within the curved outer periphery into free space modes propagating out of the plane of the resonator." (11/22-23)



Regarding **claims 2, 3, 28 and 29**, Figs 7 and 8 of '490 disclose a grating-outcoupled microcavity disk resonator as described above

2. "wherein the grating region [84] is a set of periodic features [grooves] formed in or on a cladding layer [spacer/barrier 72] of the resonator [70,80].
3. "wherein the periodic features [84] have an asymmetric shape [85].

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28, 29. "wherein the grating-outcoupled cavity resonator comprises a heterostructure formed using at least one of InP (claim 28) and InGaAsP (claim 29)." (7/27-29)

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

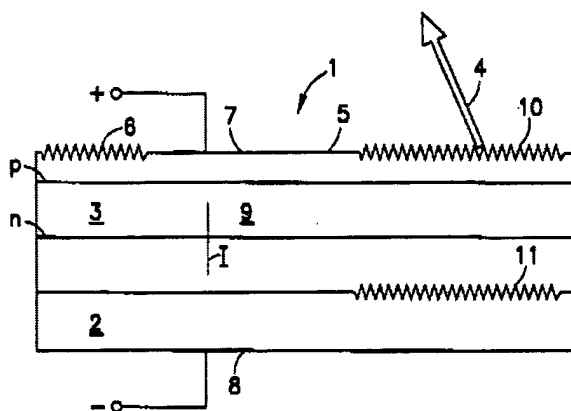
**Claims 7 and 8** are rejected under 35 U.S.C. 103(a) as being unpatentable over '490 as applied to claim 1 above, and further in view of Baird et al. (5,559,824) hereinafter '824.

Regarding **claims 7 and 8**, Figs 7 and 8 of '490 disclose a grating-outcoupled microcavity disk resonator as described above, but do not disclose "that the grating region forms at least a second-order (claims 7) distributed feedback grating (claim 8)."

However, second-order DFB gratings in semiconductor lasers are well known in the art as evidenced by '824 (6/29-47).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of '824 into the device of '490 by making a grating in the microcavity disk resonator a second-order DFB grating for at least the purpose of controlling the spectral bandwidth and wavelength of the output. Also, second order grating eliminated the degeneracy of the two longitudinal modes allowing propagation of a single longitudinal mode.

**Claims 18 - 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over '490 as applied to claim 1 above, and further in view of Portnoi et al. (6,219,369) hereinafter '369.



Regarding **claims 18-20**, Figs 7 and 8 of '369 disclose a grating-outcoupled microcavity disk resonator as described above, but do not disclose the specific location of the grating. However, Fig 1 of '369 discloses:

18. wherein the grating region [6] is a set of periodic features formed in an upper cladding layer [p-type layer] of the resonator [1].
19. wherein the grating region [10] is formed in an upper cladding layer [p-type] and an upper waveguide layer [3] of the resonator [1].
20. wherein the grating region [10, 11] is formed in both a top cladding layer [p-type layer] and a bottom cladding layer[n-type layer] of the resonator [1].

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of '369 into the device of '490 by positioning the

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grating in both the top and the bottom cladding layer for at least the purpose of providing a distributed feedback and increasing output efficiency of the laser.

**Claims 25, 26 and 30** are rejected under 35 U.S.C. 103(a) as being unpatentable over '490 as applied to claim 1 above.

Regarding **claims 25, 26 and 30**, Figs 7 and 8 of '490 disclose a grating-outcoupled microcavity disk resonator as described above, but do not disclose "that the grating-outcoupled microcavity disk resonator comprises a III-V nitride semiconductor heterostructure formed on a substrate (claim 25); wherein the substrate comprises at least one of sapphire, silicon carbide, GaN, AlGaIn, AlN, and silicon (claim 26); wherein the grating-outcoupled microcavity disk resonator comprises a heterostructure formed using at least one of ZnSe, CdS, MgS, MgSe, CdSe, CdTe, ZnO, and MgO" (claim 30).

However, these materials/elements are well known in the art of lasers.

It would have been obvious to one of ordinary skill in the art at the time the of the invention to make the laser of these known materials/elements, since it has been held to be within the general skill of a worker in the art to select a known material/element on the basis of it's suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960).

**Contact Info**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marcia A. Golub whose telephone number is 571-272-8602. The examiner can normally be reached on M-F 9-6 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on 571-272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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